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PRINCIPAL INVESTIGATOR: Gregory A. Gahm, Ph.D.

CONTRACTING ORGANIZATION: Madigan Army Medical Center
Tacoma, Washington 98431

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6. AUTHOR(S)

Gregory A. Gahm, Ph.D.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Madigan Army Medical Center
Tacoma, Washington 98431

E-Mail: gregory.gahm@nw.amedd.army.mil

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FOREWORD

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Principal Investigator Signature: _____

Date: _____

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ABSTRACT

How much is access to care improved when patients are offered an internet delivered Behavioral Health Clinic? Can quality be measurably improved at the same time? Does this service cost less, particularly once it has been developed? How much can behavioral health care, enabled to reach across the home and work environment extend access to care and improve treatment quality? These are all questions this project will address.

Access to health care, to include behavioral health care, is a challenge faced by all military medical treatment facilities (MTFs). Patient demand and our Tricare contracts guarantee access to care. Meeting this demand is the challenge faced by our system. For behavioral health, unlike other types of health care, patients (other than active duty) do not have to seek their care first at the MTF. Patients regardless of geographic location are free to choose the provider and healthcare system they feel best meets their needs. Convincing these patients to want to choose our system is the challenge we face and a goal of our organization.

The "Health-E Clinic" web enabled behavioral health clinic provides patients access to behavioral health services 24 hours a day, 7 days a week. This e-clinic modifies clinical business processes to offer services on-line. Integration with clinical pathways is inherent in this design as patients interfacing with this system are led through decision pathways consistent with established MHS and local practice guidelines. Continuity of care is ensured with providers now able to provide follow-up care regardless of patient geographic location. The clinic design provides for maximal integration of daily practice in garrison with that on deployment.

The traditional approach to the access problem involved adding providers until supply met demand. This approach has become untenable with present day budget cuts, personnel limitations, and specialty provider shortages. Internet enabled services allow for an increased range of services to patients while minimizing patient and provider travel. Providers no longer will have to stop providing care for their regular patients when tasked to support remote locations. Patient satisfaction improves when patients receive the continuity of care enabled by asynchronous communication versus the intermittent face-to-face care they can receive when their provider is frequently unavailable. Demand for care is controlled with patients encouraged to take an active role in their own care.

In addition to supporting access to care for the patient who resides at a distance from the MTF, soldiers also require Behavioral Health support while on deployment. As the AMEDD strives to support the rapid deployment, minimal footprint requirements of the reengineered forces, providing medical care from a distance becomes all the more critical. Patients who have received care in garrison need to receive the same quality care while deployed. Integration of this project with the SMART-SM, SMART-MC3T, and initial Brigade Combat Team (3rd BDE, 2ID) support access for soldiers on deployment.

Note: This is original abstract per Mr. Winston guidance.

BODY

This project successfully responded to meet real world operational needs. Evolving external challenges, elaborated on below, resulted in a reprioritization of project deliverables and a focus on support services that could be provided without Internet connectivity. This was not to the exclusion of Internet based health care services, rather as an additional important focus. Thus, this project evolved to a two pronged effort. One major thrust was development of Internet behavioral health services. The other major effort focused on meeting behavioral health needs off-line. These were mutually supporting foci which added to project complexity.

This project remained under the direction of the original project PI and utilized a broad spectrum of behavioral health providers to assist with content development and project deliverables. The providers involved in the various project components overlapped in their responsibilities and interests and include both a local group at Ft Lewis and an AMEDD-wide group that included the senior leadership of the behavioral health specialties. The Internet based development focused on standardization of content, functionality, and cross platform compatibility exploring the potential for Army Knowledge Online (AKO) and TricareOnline integration. Specialty representatives from the Psychology, Psychiatry, Social Work and Substance Abuse programs were recruited and engaged in active development within their areas. Subspecialties within each department were also involved with efforts directed to leverage the areas with greatest potential for development. Within the Behavioral Health Clinic this included enabling clinic forms, materials, and briefings for the Internet to support soldiers and commanders on Ft Lewis. The Wellness program modified significant portions of their program for downloading and delivery through CDs. The development cut across the Behavioral Health Science Service Line at MAMC and into the Ft Lewis activities particularly within the Suicide Prevention Program which we supported through Internet enabling of their programs and briefings. This project progressed on an AMEDD level in developing an integrated BH Community of Practice on AKO leveraging the team efforts of the OTSG AKO representative and the KE development initiatives. A completed BCA was submitted based on this development consistent with the MEDCOM Reg 25-1 requirements. It completed all reviews and was approved in June 2003.

Utilizing a multidisciplinary approach, the research team identified factors critical to the success of a useful, comprehensive electronic behavioral health clinic. From this we prioritized needs and initiated development of project components, elaborated on below, which included outcome measure development, wireless deployment integration, initial development of a "Disaster Response Tool-Kit" with the VA, efforts to integrate cognitive testing, and development of a deployable electronic behavioral health record. These efforts have demonstrated their viability and are evolving, with the support of the senior behavioral health leadership, to an integrated enterprise solution.

During the tenure of this project numerous changes occurred that directly and indirectly impacted upon its delivery. The DITSCAP and SSAA requirements were formalized. DOD and other websites were identified as increased targets of attack resulting in multiple new security processes and tightening of existing processes. The 9-11 events had both a direct and indirect influence on this project. Directly this and other terrorist activities resulted in increased network and Internet downtime, increased limitations on flexibility of implementation, and website

configuration difficulties as patches and new policies were implemented and the "bugs" were worked out. Indirectly this resulted in personnel distraction and delays in response to requests for support to rapidly evolving requirements. These requirements taxed our MAMC web personnel and challenged their support abilities. These processes have impacted the delivery of Internet based services to challenge the targeted model of interactive Internet services from our local site. In particular, web content started being cached at Ft Huachuca preventing efficient interactive communication such as bulletin boards. This project continued to be challenged by long delays in order processing and installation, particularly due to our bringing in new technologies and requirements that MAMC personnel were not familiar with. These external factors did not stop efforts to provide Internet based services but impacted on what was feasible to deliver within constraints and led to greater exploration of services beyond MAMC.

The Stryker Brigade Combat Teams, one of the key target populations for this project, underwent revisions of policy, hardware, and equipment. They had been in a relatively inactive status awaiting delivery of their primary vehicle offering good availability to participate in these projects. However, this status changed and they attempted to make up for previous downtime limiting their active participation in this project during key time points. The second SBCT has now "stood-up" and will also be utilized in future project development. Finally, the absence of an approved AMEDD wireless standard impacted upon the ability to design and fully consider implementation with a wireless device.

The concept of the electronic Behavioral Health/Health-E project included establishing procedures for baseline behavioral health status evaluation of a unit, including: Behavioral Health history, Cognitive Status – ANAM, Deployment Focused Evaluation, Mental & Physical Health Functioning and Support Force Health Protection mandate. It specifically addressed the goal to function within the Field Medical Record, and be able to store records on a Personal Information Carrier (PIC).

The project execution included the prototyping of an electronic behavioral health record, FDR-BH (later renamed CBHRS), which was implemented in the Behavioral Health Clinic at Madigan Army Medical Center and with the 3/2 SBCT Mental Health Officer. The PIC component of the project was de-emphasized due to issues external to this project related to PIC deployment. The PIC has subsequently recovered its stature and would again be a logical component to this effort. Once in place, clinic staff were trained to use the software, and their feedback about requirements was gathered as a part of the research protocol. Simultaneous to this research effort, we were moving to integrate the features and functionality into an enterprise system. Our research protocol focused on user evaluation of the electronic record, in order to clarify the user requirements for e-BH records.

Additionally, we initiated several new, related efforts. We initiated a project for development of a "Disaster Response Toolkit" to support providers responding to a range of situations. This collaborative project with the VA National Centers for PTSD was adopted by the VA and developed and deployed as part of their national disaster response program. The project continued to explore wireless deployment to support field access on deployment. While controversial, due to standards approval decisions and security challenges, this project continued to push forward in this area.

We continued with efforts to integrate cognitive testing into the overall system and to establish a mechanism within this program to support ongoing behavioral health monitoring and surveillance through deployment surveillance measures and development toward a behavioral health preventive maintenance checks and services model (BH-PMCS). This effort has been supported and incorporated into the HRAII development. This Ft Lewis wide initiative directed by the I Corps Commander will be the first systematic early identification program to be implemented for BH across an entire Army post.

KEY RESEARCH ACCOMPLISHMENTS

- **Development of a behavioral health electronic record.**
  - o Developed, in partnership with TATRC, an electronic record prototype that served as a platform to function as an electronic mental health record in garrison and deployment and test requirements. The CBHRS application became the de facto Army Behavioral Health Electronic Record prototype for CHCSII and TMIP.
    - **Completed:** FDR-BH/CBHRS developed to function in the Behavioral Health Clinic at MAMC.
    - **Deployments:**
      - Bright Star, Cobra Gold, NTC, JRTC
      - 98th Combat Stress Control Detachment
      - 47th Combat Support Hospital
      - 520th Area Support Medical Command
      - 3rd/2nd Stryker Brigade Combat Team
      - First Marine Expeditionary Force
    - Currently exploring integration with ICDB/IMAP at MAMC

    Subjective evaluations of the CBHRS functionality and user acceptance were conducted at the Behavioral Health Clinic at MAMC. The most positive aspects of CBHRS were identified as being: ease of information transmission using the web or PIC, facilitation of behavioral health care, and satisfaction with user-interface and overall functionality. The most negative aspects of CBHRS were identified as being: difficulty with error correction and/or interface, excessive information required at each contact, and difficulty with use in a deployed setting. However, the positive aspects of the CBHRS proved to outweigh the negative aspects, because the usage reached 100%. Based on feedback from the users at MAMC, we know that providers prefer to use CBHRS because of its greater level of specificity and detail, and the targeted BH functions that it provides. Because of the benefits, even after the formal termination of research protocols, providers have continued to utilize the CBHRS. According to providers, the CBHRS is more functional and easier to use than ICDB/IMAP.

- **General Mental Health Functions**
    - **Completed:** Informational website was updated and included basic information about the behavioral health service line, resources on timely mental health issues.
- **Suicide Prevention**
    - **Completed:** Content added to Internet site to include briefings, materials, and critical issues. Completed support for Ft Lewis Suicide Prevention Task Force and integrated with newly published information.
- **Deployment Support**
    - **Completed:** The FDR-BH/CBHRS, including the pre/post deployment screening tool and SCORS assessment measure, have been developed to support mental health treatment on deployment. Collected normative data

on pre/post deployment questionnaire. Tracked soldier mental health status with SCORS.

- **Pre-deployment Surveillance**
  - **Completed:** A pre/post deployment screening tool has been developed and incorporated into the FDR-BH/CBHRS. Collected normative data of pre/post deployment questionnaire. Evaluated its use as a valid screening instrument. Continued exploration for integration of ANAM (computerized testing) with an electronic record.

- **Outcome Measures – Symptom Checklist and Outcome Rating Scale (SCORS)**
  - **Completed:** Developed Government Owned measure. Completed additional normative data gathering and cross validation studies. Fully implemented with intake screening process at MAMC BHC.

- **Health Promotion and Prevention information**
  - **Completed:** Developed internet-based and CD-ROM distributed Wellness exercises and videos. Finalized and expand materials and produced final versions for distribution.

- **BH Website**
  - AKO hosting approved
  - Subsequent policy decisions limited direct AKO use
  - Integrated Psychology, Psychiatry, Social Work, 91X, OT, Psych Nurse
  - Eventual integration of record, information & knowledge
  - Current development of BH Community of Practice ongoing with active participation by Knowledge Enterprise.

- **Army/MHS/DOD Coordination**
  - Requirements documented based on CBHRS requirements and field testing
  - Enterprise BH record system developed as prototype
  - Ongoing development requirements support:
    - Deployment Cycle Support Program
    - Behavioral Health Surveillance
    - AMEDD Suicide Event Report (ASER)
    - COSC

- **Enterprise BH Electronic Record**
  - BH functional requirements:
    - Documented in DOORS
    - Validated/Prioritized by FIWG
    - Validated/Prioritized by TFWG
    - Tri-Service Coordination & IPT Chartered
  - Coordinated for BHAVRS integration with:
    - Enterprise CDR –
    - DOD Master Member Index – linkage approved
  - BCA's completed x 2 (e-business review)
  - 25-1 process completed and approved

CONCLUSIONS

This project successfully proceeded beyond what would be expected within this project scope.. While the prototyped electronic record was still in its alpha version, it was deployed to Operation Bright Star to evaluate its ability to support behavioral health on a deployment. It was tasked to support the behavioral health response to Operation Noble Eagle and the subsequent Operation Solace. It was tasked to support Operation Enduring Freedom although the ultimate formal deployment was interrupted by J6 concerns over limited technology support in theater and the last minute nature of the MEDCOM request. This record system also received the interest of the Army Combat Stress Control community, which is looking to ultimately use it to support their needs.

Based on the clear need this system meets, we developed, with the assistance of TATRC, a Tri-service Integrated Research Team (IRT). The AMEDD behavioral health leadership has endorsed this and is proceeding with additional development. We are also exploring the ability to integrate this system with other Internet enabled mental health initiatives, including the TricareOnline/E-Health Portal and AKO.

Army Behavioral Health has established an IRT to develop and field an enterprise solution. Efforts continue to integrate the products with TMIP and MC4 and push requirements definition to CHCS-II for implementation within their development cycle. The project PI has the Army lead for CHCS-II behavioral health requirements definition and validation.

APPENDIX A: TECHNICAL SUMMARY

Technology Used:

- PIC
- FDR-BH
- Metadata

Personal Information Carrier (PIC)
- Device used to carry personal medical data regarding the soldier (e.g. vaccines, drugs, allergies, etc.)

Metadata
- SGML
- XML (JTA 4.0 emerging std, TMIP std)
- HL7 (JTA 4.0 recognized for Medical)
- Same data across platforms
- Interoperability

Prototypes

FDR-BH/CBHRS

Development of a deployable mental health computer-based patient record - The project team identified this as a key component of the project. The team documented provider needs, analyzed JACHO requirements, and developed initial functional requirements. A prototype complete computer-based mental health record was developed, with the assistance of TATRC, building on the Field Deployable Record (FDR). This record system prototype underwent programming in coordination with TATRC and was fielded as a rapid development prototype.

The FDR was used as the development platform for the computer-based mental health record for several reasons. First, the FDR is built on the Java platform and utilizes XML technologies, which allows for platform independent and Internet-optimized integration. Second, the FDR integrates with the Personal Information Carrier (PIC). The PIC supports continuity of care across behavioral health organizations and between garrison and deployment. The PIC also obviates the needs for Internet connectivity and the project development challenges associated with such. This has been particularly important with the evolving Internet security threats.

APPENDIX B: FUNDED PERSONNEL AND PARTICIPANTS

The project was funded at a level of $200,000. This was reduced from the requested $438,000. In spite of this significant decrement the project was able to leverage multiple efforts to succeed. Funds were efficiently transferred to MAMC via MIPR and allocated to a unique APC at MAMC. Obligations and accounting have been managed by the PI with the assistance of Departmental and project personnel. Project rescoping was conducted to maximize the value of project delivery.

Project Mgmt/Clinical Offset:	40,000
Project Assistant/Programming:	117,250
Equipment:	21,000
Software:	9,000
Travel/Implementation:	13,000

APPENDIX C: PRESENTATIONS, POSTERS, PUBLICATIONS

I Corps Surgeon Briefing, 8 February 2001

Combat Stress Control VTC, 2 May, 2001

CBHRS Overview, 14 December, 2001

MAMC Informatics, August, 2002

Electronic Behavioral Health Product Line Review, 10 October, 2002

ATA Conference, 2002

ATA Conference, 2003